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Engineering Department

INTERDEPARTMENTAL COMMUNICATION

To: **Board of Appeals** ***Date:*** October 27, 2004

From: **Engineering Department**

Subject: **Comprehensive Permit (#04-13) Nagog Park – The Woodlands at Laurel Hill**

The plans submitted are of a preliminary nature and not adequate for a comprehensive engineering evaluation. The comments below are based upon the preliminary information shown on these plans dated October, 2004. It is our understanding that after the initial review of the project a final definitive set of plans will be submitted for a follow-up review by the Town prior to approval by the Zoning Board of Appeals.

1. The contractor will be required to apply for a State Permit for the work shown within the layout of Great Road (Route 2A/119) such as the proposed changes to the traffic signal, the extension of the Town of Littleton's water main and the placement of directional signs on Great Road for this development. Nagog Park, Nonset Path at the affected location and Westford Lane are private roads. The applicant will need to notify and/or seek approvals from the owners of these roads for the work shown in the layouts of the private roads.

2. The existing property line monumentation such as the iron pipes, concrete bounds, drill holes, the stone bound marking the Town corner between Acton and Westford and "cathead rock" are not labeled on the plans. We are concerned that some of these points will be disturbed and/or destroyed during construction, especially the Town corner bound. These monuments should be labeled on the plan along with a note to mark these points in the field prior to construction. There should also be a note on the plans stating that if these property markers and the Town corner bound and cathead rock are damaged or destroyed during construction that the applicant will hire a registered land surveyor to reset the monuments and certify the new locations.

3. When the recordable subdivision plan is created for this development the engineer should show the location of the conservation restriction area(s).

4. The plans should be stamped by a registered land surveyor to certify the location of the property lines.

5. The engineer requests a waiver from the local requirement for a water balance calculation in accordance with the Zoning Bylaw. It states in the Storm water Analysis that the drainage system will comply with the phase II of the National Pollution Discharge Elimination System and the Massachusetts Storm water Management Policy. Prior to the final plan approval, the engineer should submit a copy of their Storm Water Management forms so that we can review the adequacy of the proposed on-site drainage system, including recharge to groundwater.

6. The drainage calculations submitted with the comprehensive permit do not include a detailed study of the proposed drainage system. We cannot review the adequacy of the recharge trenches or the on-site drainage system such as the drain pipes, catch basin grate inlet capacities without the engineer's on-site drainage sizing calculations. One of our concerns is that the velocity and volume of runoff on the access drives might exceed the inlet capacity of the catch basin grates on Laurel Hill Drive and Dogwood Way. As a result, more runoff will discharge onto Nagog Park and Westford Lane than what pre-exists causing minor flooding and possible icing problems. We would also need copies of the soil test logs to verify the soil infiltration rates and the estimated groundwater elevations. The drainage calculations submitted with the application analyze the storage capacity of the detention basins and the off-site peak runoff rates based on post development changes in land coverage (imperious areas, lawn & buildings, etc). The engineer states in the drainage summary that a detailed pipe sizing and design of the proposed drainage system will be conducted prior to issuance of the construction drawings. The plans that we have reviewed are stamped "for permitting purposes only, not for construction". Prior to the final plan approval, the engineer should submit a copy of their detailed drainage calculations so that we can review the proposed drainage system

7. A note should be added to the plans referencing the National Geodetic Vertical Datum that was used for the elevations shown on the plans. The Town requires the elevations referenced to the National Geodetic Vertical Datum of 1929. Prior to the final plan approval, the engineer should submit the construction drawings showing at least two temporary benchmarks on the site. The temporary benchmarks should be located on fixed objects that will not be disturbed during construction.

8. Prior to the final plan approval, the applicant will have to propose street addresses for the units on the site. We are concerned about the potential confusion with the building addresses and the individual unit numbers, especially during a 911 emergency. The applicant will need to obtain final approval for the street addresses from the Engineering, Police and Fire Departments.

9. The applicant needs to obtain approval from the Police and Fire Departments for the proposed street names (Laurel Hill Drive and Dogwood Way) to ensure that there is no confusion during a 911 emergency with other existing street names in Town such as **Laurel Court**.

10. We are concerned about the amount of parking spaces provided for the development for residents and guests. The applicant has requested a waiver from local zoning to allow less than 2 parking spaces per dwelling unit. We were unable to locate the total number of parking spaces provided on the site but we are assuming based on the waiver request that there will be a lack of parking for guests. The total number of parking spaces proposed should be sufficient to prevent on-street parking that would hinder emergency vehicles. The applicant should provide documented studies that support their number of parking spaces or provide the spaces required by the Zoning Bylaw.

11. The Fire Chief should review the plans to determine accessibility for a fire truck.

12. The engineer might need some additional signage along the emergency access road behind buildings #9 & #10 to alert residents and guests that this access is for emergency and maintenance vehicles only and parking is not allowed.

13. We recommend that the engineer show a proposed crosswalk and handicap sidewalk ramps on Nagog Park at the intersection with Laurel Hill Drive. The engineer would have to show a proposed handicap ramp for the existing sidewalk on the opposite side of Nagog Park and add two crosswalk warning signs at this location as required in Section 2C.37 of the Manual on Uniform Traffic Control Devices (Millennium Edition).

14. The engineer should label the sight distance along Nagog Park and Westford Lane on the plans for vehicles exiting the site.

15. We recommend that a stop sign and a white stop line be shown on Laurel Hill Drive at Nagog Park and Dogwood Way at Westford Lane. The applicant might want to consider additional stop signs for the interior parking area driveways at the intersection with the main access roads (Laurel Hill Drive and Dogwood Way).

16. The applicant's traffic engineer has proposed to modify the timing and phasing of the traffic signal at the intersection of Nagog Park and Great Road. We recommend that the Town hire a traffic engineer to perform a peer review of their traffic study and recommendations. The proposed changes to the traffic signal on Great Road at Nagog Park are subject to final approval by MassHighway.

17. The engineer should add a note to the plans specifying that the pavement markings will be applied to demarcate items such as parking spaces, fire lanes and crosswalks.

18. If the applicant intends to have a sign identifying the development, the engineer should show the location of this sign on the plans.

19. There are no dumpster locations shown on the plan. The engineer should address the issue regarding the locations and screening for dumpsters or other forms of trash receptacles.

20. The engineer should include an inspection/maintenance schedule for the underground recharge areas, in layman terms, so that the parties responsible can easily understand

when routine cleaning is necessary or if there is a problem due to clogging, etc.

21. Drainage System Operation Note #3 on the Erosion and Sedimentation Control Plan mentions washing vehicles within buildings with a floor drain system that will not allow the wash water to enter any part of the on-site drainage system. The engineer should explain which buildings or carports will have floor drains and how it will be designed and maintained in order to prevent the runoff from entering the proposed drainage system.

22. The engineer should specify the type of gas/oil hood that will be installed in the proposed catch basins on the plans. The Town has two basic types of gas/oil hoods installed in Town catch basins. The first type of gas/oil hood is a two-piece cast iron unit similar to the Lebaron L-219 gas/oil hood. The Lebaron L-219 is a 2-piece unit with a collar that mounts through the sidewall and the drain pipe connected on the outside of the structure. We have had numerous problems in the past with contractors installing the pipes into the structure and trying to retrofit these hoods inside the pipe in an incorrect manner. As an alternative, Lebaron manufactures another type of hood that is called "The Snout" which allows the standard construction practice of installing the drainage pipe through the sidewall of the structure.

23. We recommend that the engineer show a crushed stone base underneath the drainage catch basins and manhole structures instead of compacted gravel.

24. The engineer should add a detail for the steel grates proposed on top of the drainage outlet structures.

25. The engineer has shown a detail for a catch basin with a double grate on top of the structure, but the plans do not label the locations where these structures are located on the site.

26. The engineer should add a detail of the underground storm water storage areas. The detail should clearly describe the dimensions of the trench and the amount and size of the crushed stone required around the 24-inch perforated pipes.

27. The detail for a typical sign should specify that traffic-related signs will conform to the latest version of the Manual on Uniform Traffic Control Devices.

28. The detail for a typical street cross-section shows the sidewalk cross slope to range from 2% to 1/4 inch per foot. This exceeds the allowable cross slope as allowed by the Architectural Access Board. The cross slope should be corrected on the detail and a note should be added to the plans stating that sidewalk construction, including handicap sidewalk ramps will comply with the Architectural Access Board. The Town uses a maximum allowable sidewalk cross-slope of 3/16 inch per foot (approx. 1.6%).

29. The engineer should add a typical cross-section for the proposed 14-foot wide gravel road and gate that is labeled to be constructed in place of the existing 8-foot wide gravel access road on Parcel 18 of Town Map B-5 (Plan No. 100-OS-2). This section of Nonset Path is a private road. The applicant might need to notify and/or seek approval from the owner(s) of

Nonset Path for the proposed work shown within the road layout.

30. The engineer shows a label along Westford Lane on the Off-Site Improvement Plan (Plan No. 100-OS-2) stating the former location of Durkee Lane. If the engineer intends to realign/redesign the road, a plan and profile of Westford Lane should be submitted with this project prior to the issuance of a building permit. We have a copy of the proposed Plan and Profile sheet for Westford Lane dated June 11, 1998. Developer, Jim Fenton, submitted this plan for Westford Lane in 1998 to the Planning Board to declare the status of Westford Lane as a street as defined by the Zoning Bylaw. We can provide a copy of this plan to the applicant in order to help in the reconstruction of Westford Lane after the utility & water main installations are completed.

31. The engineer should add a note to the plans requiring the removal of organic and unsuitable material underneath the gravel layers for the proposed road, driveways, parking areas and sidewalk.

32. The engineer should label the angle of the sloped granite curb on the detail (Plan No. 100-D-1). The Town recommends that the sloped granite curbing be set at a 60-degree angle from the horizontal instead of a 45-degree angle.

33. The detail for the concrete sidewalk only requires 8-inches of gravel underneath the concrete. The Town generally requires a minimum of 9-inches of gravel for sidewalks.

34. The engineer should add a note or detail to the plans stating the dimensional requirements for a standard parking space, a small car parking space and the associated maneuvering aisles.

35. There is a detail for a steel beam guardrail and a wood guardrail on the detail sheets, but the engineer has only shown a line type for a wood guardrail on the Site Plans. If a wood guardrail is used along the access drives, the engineer should submit documentation to prove that the 4"x10" timber rail can adequately prevent a vehicle from driving through the timber rail and down the steep embankments. As a possible alternative to the steel beam rail, the engineer could propose a steel-backed timber guardrail. The Franklin Regional Council of Governments has a publication entitled "Design Alternatives for Rural Roadways" which talks about steel-backed timber guardrails that have been successfully crashed tested at about 50 mph with an impact angle of 20-25 degrees.

36. The engineer should explain what will be done with the existing drainage system in Highridge Way. If the existing drainage structures and pipes are to be removed, the engineer should label this on the plans.

37. The engineer should describe the locations of mailboxes for the proposed buildings.

38. The applicant should coordinate the water main installation work on Westford Lane with the Police and Fire Departments. We are concerned about providing access for emergency vehicles as well as the residents on Westford Lane during the installation of the 2 water mains on Westford Lane.

39. We recommend that an as-built plan showing the buildings, pavement, drainage and utilities be required at the conclusion of construction to show that the project was constructed according to the approved plans.

Cc: Board of Selectmen
Don P. Johnson, Town Manager
Garry Rhodes, Building Commissioner